AMENDMENTS TO THE CLAIMS

1. (Previously presented) A method for changing binding strength of an isolated force-activated bond stress-dependent adhesion molecule (I-FABSDAM) to a force-activated bond stress-dependent binding ligand (FABSDB-L) for the I-FABSDAM, comprising:

binding the I-FABSDAM with the FABSDB-L; and

changing a bond stress on the I-FABSDAM, wherein the binding strength between the I-FABSDAM and the FABSDB-L increases when the bond stress increases and decreases when the bond stress decreases.

2. (Original) The method of claim 1 wherein said bond stress is caused by a shear force.

3. (Withdrawn) The method of claim 1 wherein said bond stress is a tensile force.

4. (Original) The method of claim 1 comprising increasing said bond stress whereby said binding strength is increased.

5. (Withdrawn) The method of claim 1 comprising decreasing said bond stress whereby said binding strength is decreased.

6. (Original) The method of claim 2 wherein said method results in said I-FABSDM being tightly bound to said FABSDB-L.

7. (Original) The method of claim 1 wherein said I-FABSDAM is selected from the group consisting of adhesins, selectins, integrins, cadherins, immunoglobulin superfamily cell adhesion molecules, and syndecans that are capable of binding in a force-activated bond stress-dependent manner.

8. (Original) The method of claim 7 wherein said adhesion comprises a FimH polypeptide, or the lectin domain of FimH polypeptide.

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

9. (Original) The method of claim 8 wherein said FimH polypeptide is an E. Coli FimH polypeptide.

10. (Withdrawn) The method of claim 6 wherein said I-FABSDAM comprises a polypeptide having the sequence of Genbank Accession Number P08191.

11. (Withdrawn) The method of claim 6 wherein said FimH polypeptide is engineered.

12. (Withdrawn) The method of claim 6 wherein said FimH polypeptide is a FimH-f18 polypeptide derived from the E. Coli strain f18.

13. (Withdrawn) The method of claim 12 wherein said FimH-f18 polypeptide is engineered to comprise a valine at amino acid position 27.

14. (Withdrawn) The method of claim 6 wherein said FimH polypeptide comprises an amino acid substitution selected from the group consisting of a proline at position 154, a proline at position 155, a proline at position 156, a leucine at position 32, and an alanine at position 124.

15. (Withdrawn) The method of claim 8 wherein said FimH polypeptide is FimH-j96.

16. (Original) The method of claim 1 wherein said FABSDB-L comprises mannose or fructose.

17. (Original) The method of claim 16 wherein said mannose is selected from the group consisting of monomannose, trimannose, and oligomannose.

18. (Currently amended) The method of claim 1 wherein said I-FABSDAM is attached to a particle or a surface,

wherein the particle is selected from the group consisting of bacterial pili, ~~naturally occurring isolated molecules, synthetic molecules, proteins, polypeptides,~~ organelles, prokaryotic

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

cells to which said I-FABSDAM is not native, eukaryotic cells to which said I-FABSDAM is not native, viruses, organisms, nanoparticles, [[and]] microbeads, and microparticles, and

[[or a]] wherein the surface is selected from the group consisting of cell membranes, device surfaces, and synthetic substrate surfaces.

19. (Currently amended) The method of claim 18 wherein said FABSDB-L is [[also]] attached to said particle or the surface.

20. (Currently amended) The method of claim 1 wherein said FABSDB-L is attached to a particle or a surface,

wherein the particle is selected from the group consisting of bacterial pili, ~~naturally occurring isolated molecules, synthetic molecules, proteins, polypeptides,~~ organelles, prokaryotic cells to which said I-FABSDAM is not native, eukaryotic cells to which said I-FABSDAM is not native, viruses, organisms, nanoparticles, [[and]] microbeads, and microparticles, and

[[or a]] wherein the surface is selected from the group consisting of cell membranes, device surfaces, and synthetic substrate surfaces.

21. (Currently amended) The method of claim 20 wherein said I-FABSDAM is [[also]] attached to said particle or the surface.

22. (Original) The method of claim 1 wherein changing said bond stress comprises applying a bond stress between a bond stress dependence lower threshold of said I-FABSDAM and a bond stress dependence upper threshold of said I-FABSDAM.

23. (Original) The method of claim 1 wherein changing said bond stress comprises applying a bond stress between about 0.01 dynes/cm^2 and about 100 dynes/cm^2.

24. (Original) The method of claim 1 wherein changing said bond stress comprises applying a bond stress between about 0.05 dynes/cm^2 and about 20 dynes/cm^2.

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS^{PLLC}
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

25. (Original) The method of claim 1 wherein changing said bond stress comprises applying a bond stress between about 0.1 dynes/cm^2 and about 10 dynes/cm^2.

26. (Withdrawn) The method of claim 1 applied to a system wherein a first component of said system comprises a plurality of said I-FABSDAM attached to a first object, wherein a second component of said system comprises a plurality of said FABSDB-Ls attached to a second object, and wherein said I-FABSDAMs and FABSDB-Ls are capable of binding to each other in a force-activated bond stress-depending manner, and wherein said method comprises increasing bond stress on said I-FABSDAMs, resulting in said first component changing from being unbound to said second component to being bound to said second component.

27. (Withdrawn) The method of claim 1 applied to a system wherein a first component of said system comprises a plurality of said I-FABSDAMs attached to a fi5rst object, wherein a second component of said system comprises a plurality of said FABSDB-Ls are capable of binding to each other in a force-activated bond stress-dependent manner, and wherein said method comprises decreasing bond stress on said I-FABSDAMS, resulting in said first component changing from being bound to said second component to being unbound from said second component.

28. (Withdrawn) The method of claim 1 applied to a system wherein a first component of said system comprises a plurality of said I-FAMSDAMs attached to first particles, and a second component of said system comprises a plurality of said FABSDB-Ls attached to second particles, said method comprising homogenously mixing said first and second components, then increasing said bond stress on said system, whereby a substantially uniform material comprising complexes of said first components with said second components is formed.

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS^{PLLC}
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

29. (Withdrawn) The method of claim 28 further comprising cross-linking said substantially uniform material once said complexes have been formed by increasing said bond stress.

30. (Withdrawn) The method of claim 1 wherein a plurality of said I-FABSDAMs are attached to a first selected surface of a plurality of first selected three-dimensional forms, wherein a plurality of FABSDB-Ls are attached to second selected surface of a plurality of second selected three dimensional forms, and wherein said changing is increasing, thereby resulting in said first and second forms self-assembling into a selected geometric pattern.

31. (Withdrawn) The method of claim 30 wherein said first form is the same as said second form.

32. (Withdrawn) The method of claim 31 wherein said first and second forms are cylinders, wherein said first and second surfaces are the curved sides of said cylinders, and said geometric pattern is a layer composed of said cylinders.

33. (Withdrawn) The method of claim 32 wherein said layer is a synthetic membrane.

34. (Withdrawn) The method of claim 30 wherein said first and second forms are cylinders, wherein said first and second surfaces are the flat ends of said cylinders, and said geometric pattern is a chain composed of said cylinders.

35. (Withdrawn) The method of claim 34 wherein said first form has said I-FABSDAMs attached thereto but does not have FABSDB-Ls capable of binding said I-FABSDAMs attached thereto; wherein said second form ahs said FABSDB-Ls attached thereto but does not have FABSDAMs capable of binding said FABSDB-Ls attached thereto; and said geometric pattern is an alternating link chain.

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

36. (Withdrawn) The method of claim 30 wherein said first and second forms are cylinders, wherein each cylinder comprises a first flat end and a second flat end, wherein said first flat ends are attached to said I-FABSDAMs and said second flat ends are attached to said FAMSDB-Ls, and said geometric pattern is a directional chain composed of said cylinders.

37. (Withdrawn) The method of claim 1 performed in a fluid-containing channel, wherein a plurality of said I-FABSDAMs and said FABSDB-Ls are attached to particles or surfaces and are present in an amount sufficient to clog said channel when said I-FABSDAMs and said FABSDB-Ls are bound to each other, said method comprising changing said bond stress on said I-FABSDAMs whereby said binding strength of said I-FABSDAMs and FABSDB-Ls is changed, whereby the flow rate of said fluid through said channel or the pressure drop is changed.

38. (Withdrawn) The method of claim 37 wherein said bond stress is increased causing said I-FABSDAMs and FABSDB-Ls to be bound to each other, whereby said flow rate is decreased.

39. (Withdrawn) The method of claim 37 wherein said bond stress is decreased causing said I-FABSDAMs and FABSDB-Ls to be unbound to each other, whereby said flow rate is increased.

40. (Withdrawn) The method of claim 37 wherein said I-FABSDAMs and/or said FABSDB-Ls are bound to particles.

41. (Withdrawn) The method of claim 37 wherein said I-FABSDAMs or said FABSDB-Ls are bound to a wall of said channel.

42. (Withdrawn) The method of claim 37 wherein said channel is in fluid communication with a fluid exit port and a bypass port, wherein changing said bond stress changes the amount of fluid flowing through said exit and bypass ports.

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

43-84. (Canceled)

85. (Withdrawn) A method for changing binding strength of an isolated force-activated bond stress-dependent adhesion molecule (I-FABSDAM) to a force-activated bond stress-dependent binding ligand (FABSDB-L) for said I-FABSDAM, said method comprising changing a bond stress on said I-FABSDAM; wherein said binding strength increases when said bond stress decreases and decreases when said bond stress increases; wherein said bond stress is between an upper force-activated bond stress-dependent threshold of said I-FABSDAM and a higher force-activated bond stress-dependent binding threshold of said I-FABSDAM.

86. (New) The method of Claim 1, wherein the I-FABSDAM comprises a FimH polypeptide or the lectin domain of FimH polypeptide and is attached to a first pili carrier particle, wherein the FABSDB-L comprises a mannose and is attached to a second pili carrier particle, and wherein the bond stress is increased resulting in the increased binding strength between the I-FABSDAM and the FABSDB-L.

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100